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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/032,372	12/21/2001	Jeffrey A. Trogolo	A-035 US	5146

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AGION TECHNOLOGIES  
60 Audubon Road  
Wakefield, MA 01880

EXAMINER

CHOI, FRANK I

ART UNIT	PAPER NUMBER
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1616

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center"><b>Office Action Summary</b></p>	<b>Application No.</b> 10/032,372	<b>Applicant(s)</b> TROGOLO ET AL.	
	<b>Examiner</b> Frank I Choi	<b>Art Unit</b> 1616	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 7/15/2004, 9/23/2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-23,38-45 and 51-58 is/are pending in the application.
- 4a) Of the above claim(s) 12,41 and 43 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11,13-23,38-40,42,44,45 and 51-58 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-23,38-45 and 51-58 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)<br>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)<br>3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____. | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____.<br>5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)<br>6) <input type="checkbox"/> Other: _____. |
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**DETAILED ACTION**

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/15/2004 has been entered.

***Claim Rejections - 35 USC § 112***

Claims 51,53 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant does not provide any evidence and Examiner is unable to find disclosure in the Specification which recites a microcapsule size of about 10 microns. As such, it appears that at the time the application was filed inventor(s) did not have possession of the claimed invention.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-11, 13-23,38-40,42,44,45,51-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hagiwara et al. (US Pat. 4,775,585) in view of Konagaya et al. (US Pat. 6,013,275), Takebayashi et al. (US Pat. 6,156,245), Niira et al. (US Pat. 5,556,699), Wada et al.

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(US Pat. 3,981,970) and Turner et al. (US 2004/0043341) for the reasons of record and the further reasons below.

Hagiwara et al. teach the incorporation of antibacterial silver zeolite particles in polymers such as ABS resins (See entire references, especially, Column 4, lines 44-58).

Konagaya et al. teach that the antibacterial activity of silver zeolite can be increased by incorporating the same in a hydrophilic substance which is an organic compound or a high molecular compound containing at least one of a hydroxyl group, amino group, amide group, carboxyl group or alkali metal salts thereof, such as homopolymers or copolymers of polyacrylic acid, homopolymers of copolymers of polymethacrylic acid or 2-hydroxyethyl methacrylate and that the same can be incorporated into a suitable thermoplastic or thermosetting resin (Column 3, lines 16-26, Column 5, lines 2-13, Column 8, lines 48-51, Column 9, lines 4-6, Column 10, lines 34-36, Column 13, lines 1-14).

Takebayashi et al. disclose a method of microencapsulating silver zeolite with acrylic acid copolymers where the average diameter of the obtained microcapsule is usually from 0.03 to 300 micrometers (See entire reference, especially Column 2, line 63, Column 5, line 47, Column 6, lines 28-31).

Niira et al. teach that antibiotic zeolites containing silver which further incorporate ammonium ions effectively prevent discoloration of resins into which the antibiotic zeolites are incorporated (Column 2, lines 11-23).

Wada et al. teach that the exchange of cations in zeolite is a equilibrium reaction (Column 1, lines 1-48). An exchange reaction process is taught whereby silver ions are introduced to sodium containing zeolite with the result being silver zeolite plus any excess silver ion and sodium ion (Column 3, lines 5-11). An exchange reaction process is taught in which

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nitric acid is introduced into silver zeolite with the result being hydrogen zeolite, silver nitrate and any excess nitric acid (Column 3, lines 12-15).

Turner et al. discloses that sodium nitrate reduces discoloration caused by silver (Paragraphs 0061, 0062).

The difference between the prior art and the claimed invention is that the prior art does not expressly disclose a silver zeolite which is encapsulated with an acrylic resin, especially poly (hydroxyethyl methacrylate) having an average diameter of about 2000 microns or less, optionally further comprising an ammonium salt or sodium nitrate or optionally further incorporated into an addition polymer, especially ABS. However, the prior art amply suggests the same are antibacterial silver zeolites which are incorporated into polymers such as ABS, the combination antibacterial silver zeolites and hydrophilic polymers, such as acrylics, including hydroxyethyl methacrylic, the use of ammonium ions and the exchange of silver with sodium ions and nitric acid are known in the art. As such, it would have been well within the skill of and one of ordinary skill in the art would have been motivated to modify the prior art as above with the expectation that the combination of antibacterial silver zeolites and hydrophilic polymers such as hydroxyethyl methacrylic polymers would result in increased antibacterial activity, that addition of ammonium ions would inhibit discoloration of polymer resins, such as ABS, in which the antibacterial zeolite/hydrophilic polymer is incorporated and that the addition of a salt of sodium ion and nitric acid, i.e. sodium nitrate, would drive the silver ions out of the zeolite thereby increasing the amount of free silver ions available for antibacterial effect.

Examiner has duly considered Applicant's arguments but deems them unpersuasive.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on

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combinations of references. See *In re Keller*, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 231 USPQ 375 (Fed. Cir. 1986). Further, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 208 USPQ 871 (CCPA 1981).

Applicant's declaration does not show that the ABS polymer disclosed is incompatible with the composition in Konagaya or that the composition in Konagaya would not form discrete phases in the ABS polymer. As such, Applicant's arguments relative to the formation of a single phase as opposed to a two-phase product and resultant differences and/or advantages are not supported by Applicant's affidavit. Further, Konagaya et al. does not require that the antibacterial component be laminated onto an organic substrate. Konagaya et al. discloses that when used alone that antibacterial component can impart high antibacterial properties to films, sheets, plastics, high molecular binders and the like (Column 36, lines 15-29).

Applicant argues that the size of the particle is critical, however, Applicant has not provided any evidence of this criticality. Applicant's declaration provides supposed reasons why it is believed that particle size is critical but the affidavit provides no evidence of criticality, i.e. comparative data. The claim recites an average diameter of about 2000 microns or less which means that not only can individual particles be greater than 2000 microns so long as the average diameter is about 2000 microns or less but the average diameter itself can be greater than 2000 microns by action of the term "about" which is not defined by the claims. Applicant makes the general argument that "about" is based on the goals and objectives of the claimed invention. However, Applicant does not define what sizes are and are not with the scope of the term

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“about”. In any case, the prior art discloses average particle sizes falling within the claimed range (See Hagiwara et al., Table I and Takebayashi et al., Column 6, lines 27-31). Hagiwara et al. is not irrelevant as the size of the unencapsulated particles is clearly relevant to the minimum size of the encapsulated particles. As such, contrary to Applicant’s arguments the prior art does disclose the microencapsulation of inorganic antimicrobial agents.

Applicant argues based on Applicant’s Declaration that two phase system is not generally suitable for forming polymer films, however, the Declaration does not provide evidence supporting said assertion. The assertion that the particle sizes of the present invention are generally much greater than 15 microns is without merit as the claims clearly allow sizes which are smaller than 15 microns. In any case, Applicant has not provided evidence that film size of 15 microns in Nira would be unsuitable even if the average particle size was 15 microns. Applicant argues that the use of ammonium ions produces a benefit not disclosed by Niira, however, it is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by applicant. See *In re Linter*, 173 USPQ 560 (CCPA 1972); *In re Dillon*, 16 USPQ2d 1897 (Fed. Cir. 1990).

Applicant argues that the nitric acid does not exchange rather it is the hydrogen proton which exchanges with the silver. However, as indicated above, there is no requirement that the features of a secondary reference be bodily incorporated into the structure of the primary reference. The prior teaches that exchange of ions is an equilibrium reaction, as such, addition of sodium ions will result in the replacement of silver ions with sodium ions. The prior art also teaches that nitric acid will result in the exchange of silver also. Since sodium ions will result in replacement of silver ion, it is well within the skill of one of ordinary skill in the art to add sodium as a salt. The prior art teaches that sodium nitrate acts to prevent or reduce discoloration

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(Turner et al. (US 2003/0043341), paragraphs 0061,0062). As such, one of ordinary skill in the art would be motivated to use sodium nitrate with the expectation sodium nitrate would result in exchange of silver ions from the zeolite and reduce discoloration. Applicant provides no evidence that silver nitrate would cause discoloration and Applicant's claimed invention would be based on Applicant's assertion also form silver nitrate since sodium nitrate is present. In any case, the sodium nitrate as disclosed by the prior art reduces discoloration. Applicant's claims do not require the use of zeolite A, as such, Applicant's arguments do establish that Wada is unsuitable as a reference.

Therefore, the claimed invention, as a whole, would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, because every element of the invention has been collectively taught by the combined teachings of the references.

### Conclusion


A facsimile center has been established in Technology Center 1600. The hours of operation are Monday through Friday, 8:45 AM to 4:45 PM. The telecopier number for accessing the facsimile machine is (703) 872-9306.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank Choi whose telephone number is (571)272-0610. Examiner maintains a flexible schedule. However, Examiner may generally be reached Monday-Friday, 8:00 am – 5:30 pm (EST), except the first Friday of the each biweek which is Examiner's normally scheduled day off.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's Supervisor, Mr. Gary Kunz, can be reached at 571-272-0887. Additionally, Technology Center 1600's Receptionist and Customer Service can be reached at (571) 272-1600.

FIC

October 1, 2004



JOHN PAK  
PRIMARY EXAMINER  
OCT 1 2004